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## ON NEW FORMS OF VERTIGO.

BY DR. V. STERKI.

It was to be expected that a more exhaustive research for small *Pupidæ*, and a closer examination of materials already in the different collections, by one observer, would bring to light quite a number not only of new species but of new varieties and local forms. There are now six, or possibly seven new *Vertigo*, a part of them having been in my collection for more than three or four years, waiting for confirmation. Two represented by only two examples each—one of them from N. E. Ohio, the other from Illinois—are omitted here, although I am satisfied they are good species.

The four to be published here are established beyond a doubt, owing to the kindness of quite a number of conchologists, who furnished me specimens and sent me their whole collections of *Pupidæ* for examination. In place of minute systematic descriptions, which will follow elsewhere, I prefer here pointing out their main characters and comparing them with species already known.

***Vertigo callosa*, sp. nov.**

There are in collections two different species under the name of *V. gouldii* Binn. Their size and coloration is nearly the same, at least in most variations, as are also the apertural lamellæ as to number and position. Yet they are decidedly and constantly distinct, especially by the formation of the outer wall at the aperture. Judging from the descriptions and more especially from the figures, the true *V. gouldii* is characterized as follows: the last whorl is somewhat predominating, thus rendering the whole shell more ovate or conic ovate; the palatal wall near the aperture is decidedly flattened, or impressed, the impression comprising also the crest and being especially well marked at the "auricle" (as I name the more or less projecting part about the middle of the outer margin, to have a concise expression), forming a roundish groove outside and a decidedly projecting angle inside, thus producing the "two curves meeting in the center of the peristome." A feature, not striking but only seen by careful examination, is the position of the short tooth-like lamella at the base, somewhat nearer the margin than the end of the columella, the base perceptibly widened at that place; the said lamella is probably an equivalent of the inferior columellar

lamella, which in most of *Vertigos* stands very low, in many exactly at the base.

The other species, *V. callosa*, has the last whorl relatively less wide, so that the whole shell is of a more oblong shape. In the palatal wall, only the part behind the crest is somewhat flattened, while the latter itself forms one unbroken curve from the base up to the suture, and at the moderately projecting auricle there is only a slight flattening. The inferior columellar lamella is at the end of the columella, sometimes wanting or a mere trace. Well worthy of notice is a peculiar formation of the surface, the epiconch showing microscopic wrinkles or foliations in the direction of the lines of growth producing a peculiar silky gloss, especially on quite fresh examples, and more in some forms than in others.

The first two examples of this species I obtained in 1885 from Mr. Henry Moores, of Columbus, O., and in 1889 I saw a few more in his collection. In 1887 Mr. E. W. Roper sent me some others from Mass. Last year in different collections I saw quite a number of specimens from different places in New York near the metropolis, under various names: *V. gouldii*, *milium*, *ovata* and also mixed with *bollesiana*. Of the Ohio examples the color is somewhat lighter, the callus and the lamellæ are strong and white, while in the eastern examples they are somewhat thinner and more of the color of the shell. The name *callosa* was thus mainly derived from the Ohio form (which, however, may be regarded as a variety).

It is with some hesitation, however, that I now bring it under this head: it is the equivalent of the European *V. pygmaea*, Drap., of which I have examples for comparison from different countries of the old continent<sup>1</sup>. The two may even be identical; at least it would be absolutely impossible to distinguish New York examples from most Europeans. Both forms agree also in certain variations of the apertural lamellæ; the inferior columellar lamella may be absent in either, or there may be present a small suprapalatal fold thus rendering the number variable from 4–6, the typical, however, being 5. An examination of the soft parts will probably decide the question; so far I have not had an opportunity to make it.

On our continent, the range of distribution of the two species—*V. gouldii* and *callosa*—seems to be somewhat different, the former having been found in New York, Ohio, Illinois and Colorado, the latter from Massachusetts to Ohio.

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<sup>1</sup> Which I have partly collected myself there during a number of years.

***Vertigo binneyana*, sp. nov.**

Last year, Mr. W. G. Binney kindly presented me with two examples of a *Vertigo* collected at Helena, Montana, by Mr. H. Hemphill, which seemed to be of a new species; but yet I did not like to publish a description founded upon only these two specimens. Lately among a number of small *Pupidæ* from different parts of British America sent by Mr. Geo. W. Taylor of Ottawa, there were a few examples of this same species from Winnipeg, Manitoba, dead and weathered, but good enough to be identified.

They are of the size and general appearance of *V. callosa*, very narrowly perforate, cylindrical oblong, light chestnut-colored; whorls 5, moderately rounded, nearly smooth; aperture relatively small, peristome little expanded; outer wall with a well formed crest interrupted by a rather long revolving groove; corresponding to the crest there is a callus of lighter color; lamellæ 6; on the apertural wall a small supra-apertural and a well developed apertural; columellar appearing rather massive; at the base one, rather small but well formed, appearing tooth-like; palatals 2, long, especially the inferior. L. 2.0 D. 1.0 mill.

Probably there are other examples of this species in collections and more will be found in the northwest. It is named in honor of Mr. W. G. Binney to whom I owe the two beautiful specimens in my collection.

***Vertigo oscariana*, sp. nov.**

This is the most peculiar of our species. It is of the size of *mili-um* but oblong with either end nearly equally pointed, the last whorl being considerably narrowed and flattened towards the subtriangular, small aperture; shell thin, delicate, of pale horn color, as is the palatal wall and margin; the latter simple and straight, with a very slight, thin callus inside; lamellæ 3, whitish, rather small: one apertural, one columellar (longitudinal) and the inferior palatal; sometimes there is also a very small superior palatal. Length 1.5, diam. 0.8 m. m.

This remarkable *Vertigo* has been detected in Eastern Florida, on the coast at Mosquito Is., etc., by Mr. Oscar B. Webster and his father, Mr. Geo. W. Webster, of Lake Helen, Florida. These gentlemen took much pains to ascertain the range of distribution of this form and some others, and it is consequently only just to name the species in honor of Mr. Webster. The most striking character of it, besides the narrowed last whorl, is the thin and

straight palatal wall and margin, so that, indeed, the shell appears to be immature. But when seen under a glass of sufficient power, the margin is completed and, as already mentioned, there is a thin callus at a little distance from the margin. Moreover, Mr. Webster wrote me that of more than 150 examples he had seen, all were alike.

A few days ago, in a lot of *P. corticaria* Say, from Ithaca, N. Y., sent from Texas, there was one example of this species, the shell dead but in fair condition, a little larger and less fragile than the Florida examples, and with a well marked callus corresponding to a slight but distinct crest. The specimen may have been collected in New York, and from its appearance at least I would ascribe to it an origin north of Florida.<sup>1</sup>

By the kindness of Mr Webster I was enabled to see a living example. The foot and the lower parts of the head are nearly colorless; head, eye-tentacles and neck light gray. Jaw very tender, thin, pale yellow, consisting of about 14 longitudinal plates, shorter and wider in the middle, longer and narrower toward either end; it is much like that of *V. tridentata*, Wolf. Odontophore about 0.36 mm. long, 0.1 wide, about 110 square rows in each  $\frac{m}{3} + \frac{3}{3} + \frac{4}{x}$  teeth; central very small; laterals gradually passing into marginals; the latter serrate. Different from that of *V. tridentata*.

***Vertigo rugosula*, sp. nov.**

Related to *V. ovata* and *gouldii*; in shape more elongated than the latter, more cylindrical and somewhat larger. Apertural parts and lamellæ much like those of *ovata*, but the columella is decidedly longer and straighter, and the inferior columellar lamella is distinctly placed on it. L. 1.8–2.0 D. 1.1 mm. Of a peculiar formation is the surface: of the 5 well rounded whorls, about one and a half of the upper are nearly smooth; the following with exception of the last are distinctively and regularly striated, the last very finely but distinctly rugose in the sense of the lines of growth, near the aperture again striated. Color, dark chestnut.

This is a beautiful species, of which I saw the first example in the collection of Mr. Bryant Walker, who had found it, in April last, at Pass Christian, Mississippi. Last September, Mr. W. G. Mazyck collected a number of them on Sullivan's Island, S. C. In either place they were in company of *Pupa rupicola* Say. Quite lately I have seen one example from Lee Co., Texas, sent by Mr. J. A. Sing-

<sup>1</sup> Since the above was written, I found a few examples in drift from Guadalupe River, Texas, collected by Mr. J. A. Singley, sent by Mr. Wm. A. Marsh.

ley; it was a dead shell, and not fully mature, but recognizable. The species consequently seems to be widely distributed along the South-Atlantic and Gulf Coasts.<sup>1</sup>

In eastern Florida, Volusia Co., etc., a form has been found to be quite common which I refer to this species, but as a distinct variety which may be called *ovulum*. It is somewhat smaller, ovate, the striation and rugosity of the surface are less marked, and the inferior apertural lamella is wanting; in turn it has in most examples a lamella at the base (between inferior columellar and inferior palatal) and the callus in the palatal wall is rather strong. The coloration of part of them is somewhat lighter. It cannot be confounded with *V. ovata* Say, its relations to the type of *rugosula* being evident, and in addition, *ovata* has been found with it. Nor can it be referred to *ventricosa*: it is larger and stronger, of much darker color, its surface is not so smooth and polished, it has 3 or even 4 lamellæ more, and the columella is longer.

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<sup>1</sup> Two specimens were sent in by Mr. H. Hemphill, who collected them at Fish Camp, Fresno Co., Cal.